



# **Online Testing Technology Readiness Analysis For Abbeville County School District**

## Overview of Abbeville County School District



Abbeville County School District is located in northwestern part of the state with the District Office located in Abbeville, SC. As of February 2016, the district is comprised of 8 schools and a Career Center, serving approximately 3,085 students. Test scores for students in grades 3-8 in the district were above the state average in all areas except Writing, but did score above their peer districts in that area in 2015 and leadership is working aggressively to take the appropriate measures to enhance the learning experience and increase student achievement rates in 2016.

### **Key Data Points**

- Dr. Jonathan Phipps has served as Superintendent for the past year
- District Poverty Level is 76%
- Teacher Retention Rate is 92%
- Breakdown of schools:
  - Abbeville County Career Center, 36 years old, grades 10-12, 107 students
  - Abbeville High, 59 years old, last renovated in 2001, grades 9-12, 515 students
  - Cherokee Trail Elementary, 21 years old, grades PK-7, 404 students
  - Diamond Hill Elementary, 21 years old, grade PK-7, 280 students
  - Dixie High, 62 years old, renovated in 1972, grades 8-12, 453 students
  - John C. Calhoun Elementary, 44 years old, grades PK-5, 181 students
  - Long Cane Primary, 21 years old, grades PK-2, 400 students
  - Westwood Elementary, 31 years old, renovated in 1987, grades 3-5, 359 students
  - Wright Middle, 15 years old, grades 6-8, 385 students

### **Participating District Personnel**

Name of District Staff Member	Roles/Responsibilities
Matt Kimsey	Director of Technology

## Purpose of This Analysis

The purpose of this analysis is to provide an independent evaluation of the ability of Abbeville County School District to organize and conduct online testing for their students in grades 3-8 starting in the spring of 2017. Federal online testing guidelines will take effect in 2018 but South Carolina's legislature has implemented plans for all districts to begin formal online testing in March of 2017 for Math and ELA classes inclusive of all students in grades 3-8. This proactive technology analysis will benchmark a district and their schools in several key areas and provide a technology readiness score that will ultimately lead to a roadmap of detailed tasks and deliverables that are necessary to improve any of the deficient areas.

The three specific objectives of this analysis are:

1. Analyze the strengths and weaknesses of the school district and quantify their ability to carry out the online testing activities in 2017 and beyond while documenting any major gaps in "readiness."
2. Work with the district to identify recommendations to bridge the gap between where the district is and where they need to be in terms of technology readiness to carry out these activities.
3. Collaborate with the district to put in place a blueprint for completing any tasks (or procurements) necessary to achieve "technology readiness."

## Analysis Background

During the 2015 budget planning period, Superintendent Molly Spearman championed the General Assembly to consider the request of reserving a portion of the K-12 Technology Initiative funds for the purpose of providing technology technical assistance to rural and less affluent districts of need. After funds were allocated through the Proviso, the Superintendent's office called together a small Advisory Task Force to begin exploration of a plan of action to implement the initiative. The Task Force included South Carolina Department of Education (SCDE) staff, representation from rural school districts, legislative representation, and private sector.

### The Proviso states:

*"1.94. (SCDE: Technology Technical Assistance) Of the funds appropriated for the K-12 Technology Initiative, the department is authorized to withhold up to \$350,000 in order to provide technology technical assistance to school districts."*

The purpose and spirit of the Proviso is for the SCDE to provide technology-consulting services ("technology technical assistance") to school districts that would otherwise struggle in securing such services and resources. In particular, consulting services would initially focus on evaluating the state of technology, in participating districts, as it relates to readiness for standardized, online assessments beginning in 2017 and the capacities to offer quality computing based instruction, including Wi-Fi availability for support of instruction.

**Proposed District Participants:**

While there are a substantial number of rural-based districts in the South Carolina public school system, funds allocated for this year's initiative may not be adequate to offer high quality and much needed external, independent consulting services to all districts of need. Therefore, it is recommended that initial focus be placed on the plaintiff districts involved in the lawsuit between districts and the state (Abbeville vs. South Carolina.) and any other rural districts identified by the State Superintendent's office. As time and funding are available, other rural districts may be included. There were initially at least 30 districts involved in the state suit and about 9 remained by the end of the suit. All of the original Abbeville Law Suit districts have been given the opportunity to participate in the Online Testing Technology Readiness Analysis.

**Proposed Consulting Resources/Partners:**

The South Carolina Department of Education did not have adequate staffing to fully offer technology consulting services of this magnitude. Therefore, it was suggested that SCDE seek and secure external, independent contracted services to facilitate this initiative. The state interviewed several industry-consulting resources and opted to leverage a lead consultant who helped the state with the analysis and writing of the Educational Technology Plan for years 2014-2017. Robert Cardelli was contacted in late 2015 and the consultant team was finalized and officially began work the second week of November 2015.

**Initial Outcomes:**

As a result of the initiative, each participating district receives a personalized report detailing the consultants' findings and recommendations as to the district's technology readiness for state and other online assessments, 1:1 computing, and enhanced Internet connectivity (Wi-Fi) for the support of instruction in their schools. A blueprint outlining specific steps the district and their schools need to focus on is presented to the district's superintendent as part of the final report.

# Evolution of Online Testing Requirements

No Child Left Behind legislation required states to measure students' progress in reading and mathematics annually in grades 3-8 and at least once in grades 10-12 by 2005-2006. The *Every Student Succeeds Act* (ESSA) maintains the requirement that each state implement "a set of high quality student academic assessments in mathematics, reading or language arts, and science" (114th Congress, 2015, p. S.1177-24) among its provisions. Further, mathematics and reading or language arts assessments will be administered in each of grades 3-8, and at least once in grades 9-12.

Beginning in the 2014-2015 school year, learners faced a new testing challenge in that their assessments of learning will be via online testing of the Common Core standards. Assessments are being developed by organizations such as PARCC, DRC, ACT and SBAC. Tests may take learners from 8-10 hours to complete and must be integrated into the school's daily and weekly calendar of events to complete the necessary activities. (Doorey, 2014; Gewertz, 2013). Online testing has posed concerns about required technology, sufficient bandwidth, computerized test security, learners' technology skills, and new forms of test anxiety.

## States Must Become Familiar with Updated Legal Policies for Computerized Testing

Computerized testing raises new issues that require updating of test security laws and policies, as policies written for standardized testing administered via paper-and-pencil are no longer sufficient. ACT has a highly relevant report in this regard: [The End of Erasures: Updating Test Security Laws and Policies for Computerized Testing](#) by Michelle Croft (2014).

Croft (2014) outlined many concerns, noting that computerized testing does not eliminate cheating and test piracy. Such practices just take on different forms. Unique risks include such things as educators logging in to tests to view questions or change student responses, computer hacking, keystroke logging, printing, emailing, or storing test information in a computer outside the test delivery system. There is a greater risk of students accessing the Internet and other programs during testing. There is great concern about students using their own devices for testing and who has administrative privileges. Technology staff and teachers need to consider how testing workstations need to be positioned and secured so that students can't see what's on the monitors of others.

Croft (2014) recommended that states update their state statutes and regulations to reflect the shift to computer-administered assessments, concentrate efforts on controlling test access, and ensure that there is a single test security section within the updated manual that contains answers for any question that a test administrator has about test security. For example, policies should consider how student login information is secured. There should be rules on how tests are reactivated if disrupted. Additionally, these rules should emphasize having more than one proctor aid in the reactivation, and most importantly, proctors should maintain a log of all reactivations to provide documentation in the event of an investigation. Likewise, the technology should be secure and the testing window should be as short as possible to reduce the likelihood that items are compromised. Finally, states should implement steps to actively monitor test access issues through data reports to determine if there have been excessive logins or logins at times when testing should not occur (e.g., on the weekends), and have clear policies in place detailing how violations will be handled.

The test security section should also include an itemized list of what materials are secure (e.g., work folders, student authorization tickets with IDs and passwords, session rosters, scratch paper, reference sheets).

"Information about who can access the test should be clearly articulated across the school and communicated to all proctors on the day of testing. In addition, there should be information on how to report test security concerns and possible violations, which can be applicable regardless of the testing format" (Croft, 2014, p. 4).

It is vital for states to adequately prepare districts and schools for the evolving testing requirements and to proactively ensure educators and students are familiar with any new policies regarding computerized test administration, including what they, test proctors, and students may and may not do. Having these policies and procedures in place is critical to the success of the testing process and the legal implications for violating any of these policies are potentially severe. Advance planning and communication is required to minimize the risks associated with testing. Any technological failures in the administration of the tests could spark an outcry to invalidate the results; especially considering that high-stakes test scores are factored into school grades, teacher salaries, and federal assistance to the state. The stakes are too high!



## Changes in E-Rate Rules Will Affect Funding for Districts

The federal E-Rate Program started redirecting funding support FY 2015 (7/1/2015-6/30/2016) to focus on high speed broadband connectivity and Wi-Fi to tackle the digital divide concern. This included no longer providing funding or reducing funding support for outdated, legacy, and non-broadband related services such as...Page 12 ref: [https://apps.fcc.gov/edocs\\_public/attachmatch/DA-14-1556A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DA-14-1556A1.pdf) \*\*\*FCC Order 2015, 2016:[http://www.usac.org/res/documents/sl/pdf/ESL\\_archive/EligibleServicesList-2016.pdf](http://www.usac.org/res/documents/sl/pdf/ESL_archive/EligibleServicesList-2016.pdf)

### Page 2 summary reads as follows:

“The E-rate program: (1) restructured the former Priority One and Priority Two categories into Category One and Category Two; (2) eliminated Category One (former Priority One) support for outdated, legacy, and other non-broadband services including web hosting, email, and paging; (3) adopted a phase out of support for Category One voice services; and (4) limited Category Two support to the internal connections needed to enable high-speed broadband connectivity within schools and libraries, specifically LAN/WLAN (local area networks/wireless local area networks)-focused components (broadband internal connections components), basic maintenance of eligible broadband internal connections components, and managed internal broadband services.”

Services and Components No Longer Eligible for Support (Effective Funding Year 2015)

Category Two (Priority One)	Category Two (Priority Two)
Services and telephone components that were listed as eligible in the former Priority One category: <ul style="list-style-type: none"><li>• 900/976 call blocking</li><li>• Custom calling services</li><li>• Direct inward dialing</li><li>• Directory assistance charges</li><li>• Email</li><li>• Inside wire maintenance plans</li><li>• Paging</li><li>• Text messaging</li><li>• Voice mail</li><li>• Web hosting</li></ul>	Components included in these former Priority Two entries: <ul style="list-style-type: none"><li>• Circuit Cards/Components</li><li>• Data Protection (all except for firewall and uninterruptible power supply/battery back-up)</li><li>• Interfaces, Gateways, Antennas (other than as specified in this Order)</li><li>• Servers (other than servers necessary for caching)</li><li>• Software (other than the software that supports eligible broadband internal connections)</li><li>• Storage Devices</li><li>• Telephone Components</li><li>• Video Components</li><li>• Voice/video IP components (that had been listed in the Data Distribution entry)</li></ul>

Many districts have relied on this funding support since the start of the E-Rate program 18-years ago. Some districts rely on this funding reimbursement to purchase additional technology/services. Others used this to pay for operational (staff, etc) expenses.

**Eligible voice services are subject to an annual 20 percentage point phase down of E-rate support beginning in funding year 2015, as described in the *E-rate Modernization Order*. The reduced discount rate for voice services will apply to all applicants and all costs for the provision of telephone services and circuit capacity dedicated to providing voice services.**

# South Carolina’s Testing Requirements

The South Carolina College- and Career- READY Assessments (SC READY) are statewide assessments in English language arts (ELA)\* and mathematics that will meet all of the requirements of Acts 155 and 200, the Elementary and Secondary Education Act (ESEA) , the Individuals with Disabilities Education Improvement Act (IDEA), and the Assessments Peer Review guidance.

All students in grades 3–8 are required to take the SC READY except those who qualify for the South Carolina National Center and State Collaborative (SC-NCSC).

SC READY Assessments are not timed, and both computer-based and paper-based testing will be available. Data Recognition Corporation (DRC) is the contractor.

**\* The ELA test will be a two-day test: Session 1 (Writing) and Session 2 (Reading) for all grades.**

Estimated Times for the SC READY Assessment\*

Grades	ELA Session 1	ELA Session 2	Mathematics
3-8	2.5 hours	2.5 hours	2 hours

\*The SC READY assessments are not timed. The Office of Assessment is providing estimated times to assist with classroom scheduling. Since there are no previous testing times to serve as a guide for SC READY, these estimates represent the Office of Assessment’s best approximations. “Start” and ”Stop” times will be collected this year so that more accurate estimated times may be provided in the future. Please note that SC READY includes some new item types designed to measure a more demanding set of standards. As a result, it is anticipated that in the first year of SC READY, students may require longer testing times than in previous years.

**Links:**

- <http://ed.sc.gov/tests/middle/sc-ready/sample-items/>
- <http://ed.sc.gov/tests/middle/sc-ready/>
- <http://ed.sc.gov/tests/middle/adoption-list-of-formative-assessments/>
- [http://ed.sc.gov/scdoe/assets/File/tests/assessment-information/test-dates/SCREADYDates15-16\(1\).pdf](http://ed.sc.gov/scdoe/assets/File/tests/assessment-information/test-dates/SCREADYDates15-16(1).pdf)
- <http://ed.sc.gov/tests/elementary/general-information/>

## Overview of Technology Readiness Analysis Team

A team of independent consultants has been hired by the State of South Carolina to conduct all aspects of this assessment. The objectivity that outside resources bring to the table has helped reduce the perception that “big brother” is searching for negative data points on a district’s leadership team. The use of third party resources has helped foster open and honest dialogue and allowed the district staff and consultants to collaborate in all aspects of the process. The team is comprised of the following individuals:

### ❑ **Rob Cardelli**

- Project Manager overseeing all facets of the analysis
- More than 20 years of education and government consulting expertise
- Personally worked with over 100 education customers including helping the Department of Education in South Carolina gather requirements and write the State’s Educational Technology Plan for years 2014-2017

### ❑ **Brenda Bryant**

- Local school teacher in Richland 2 school district
- Focusing much of her attention on the readiness of students and teachers along with professional development concerns

### ❑ **Bob Jones**

- Local I/T and Management Consultant with over 30 years of experience
- Focusing much of his efforts on the infrastructure, hardware, security and funding concerns
- Expert in data analytics and reporting

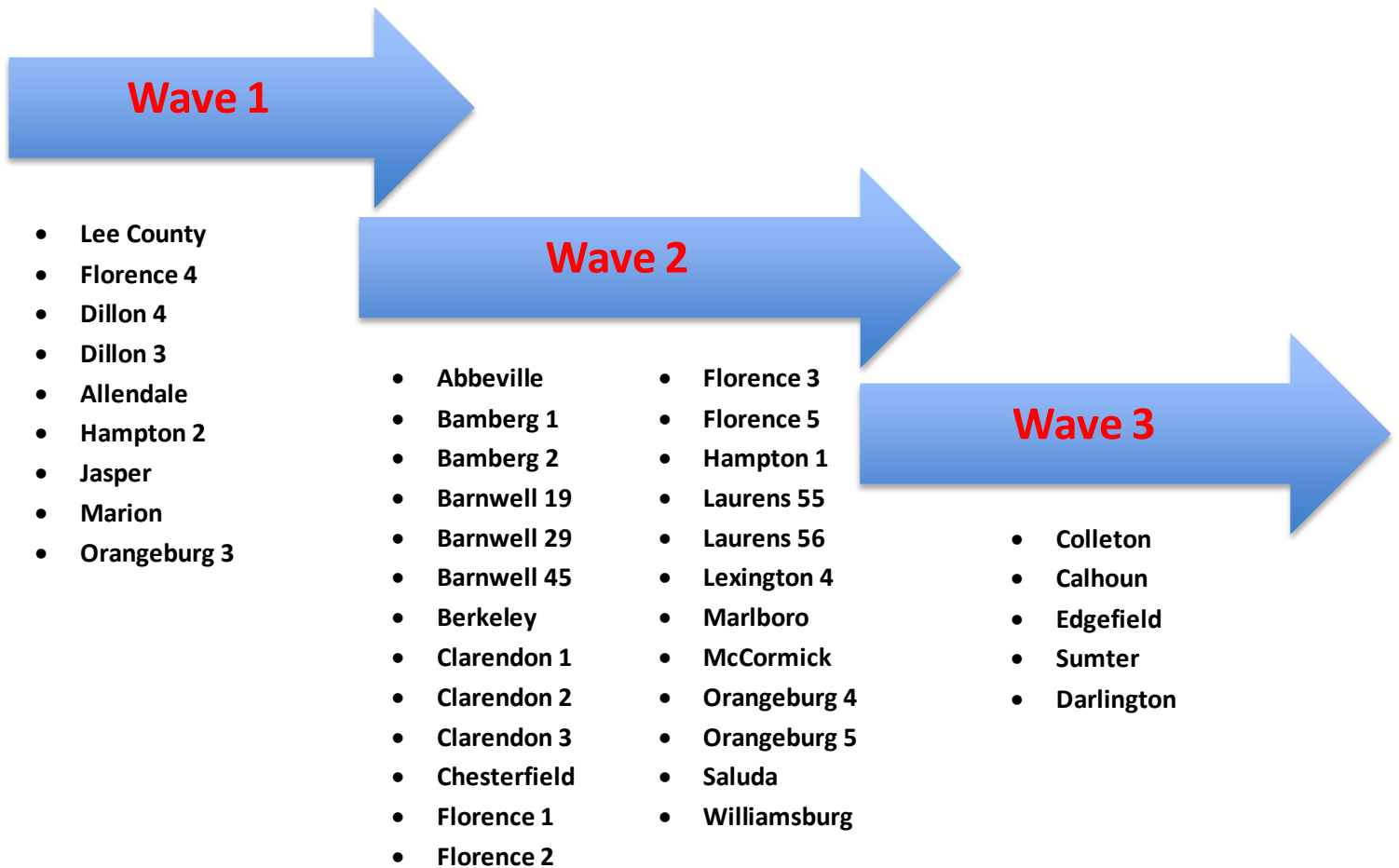
### ❑ **Heather Sutton**

- Local I/T consultant currently residing in the Orangeburg 4 district
- Focusing much of her effort on facilities, staffing levels, strategic planning and testing policy readiness levels
- Expert in data analytics and reporting

## Participating Districts

The school districts that the state has identified as potential candidates for these optional readiness analysis studies have been prioritized into the following three categories:

- ❑ **Wave 1-** Includes the nine school districts that were still involved with the Abbeville Lawsuit at the time of the verdict
- ❑ **Wave 2-** Complete list of all districts participating in the Abbeville Lawsuit at any point in time over the last 20 years
- ❑ **Wave 3-** Other districts categorized as impoverished



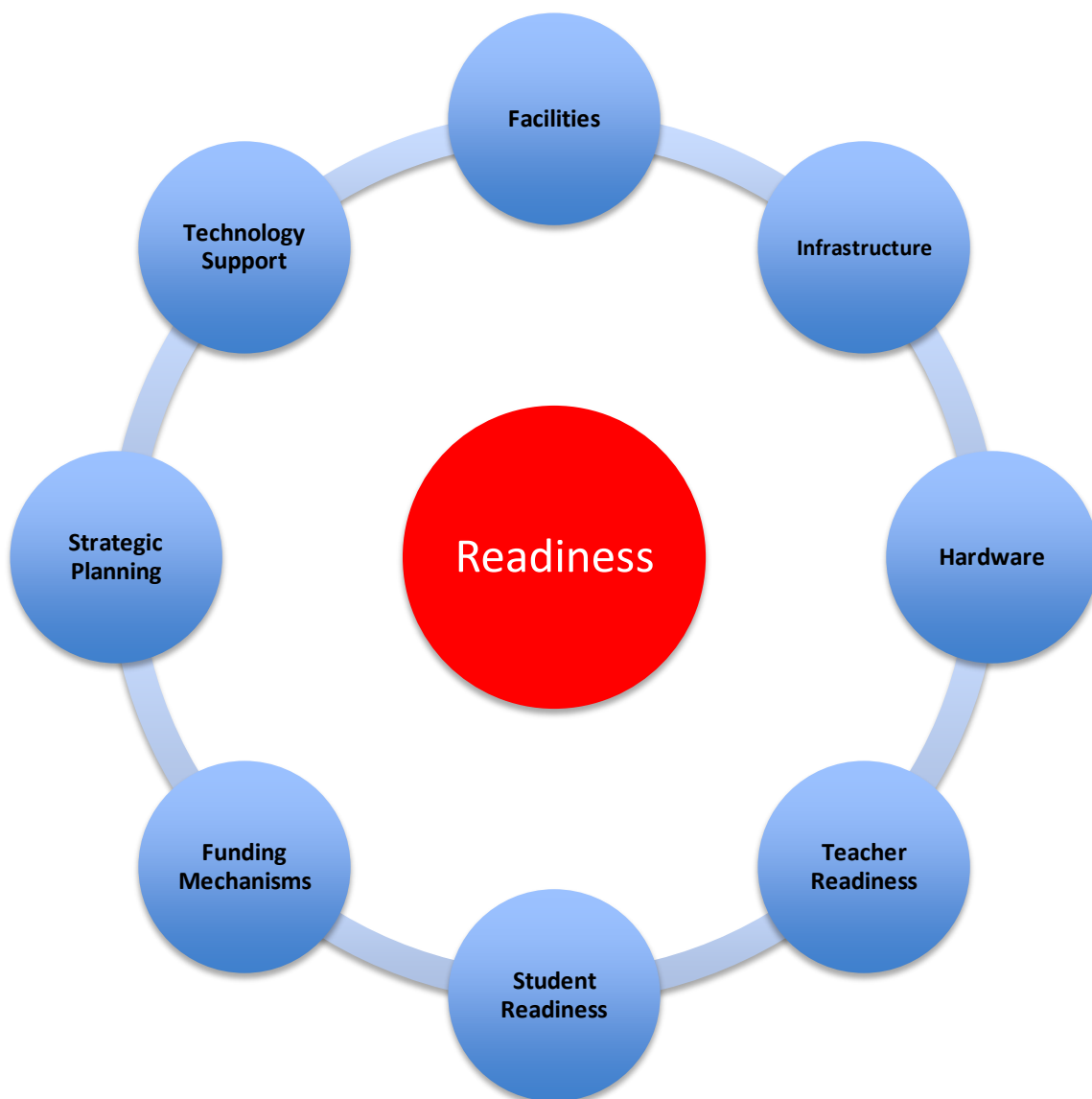
# Analysis Methodology

The consultants worked with several of the Wave 1 districts to design and ultimately refine a methodology that allows for rapid data gathering with multiple collaboration opportunities for district staff to review the findings and edit the documentation to ensure the report accurately reflects the current state of the district. The consultants realize how busy the district staff are and created a methodology that is non-invasive in nature and flexible to allow the participants to work around their “day jobs” to reduce the impact on their daily operations.



## Primary Areas of Focus

The technology analysis team identified several categories that are critical for a school district to achieve technical readiness for online testing. Within each category there are multiple variables that directly impact that category's degree of readiness. Accurately documenting these variables helps paint a picture of the overall level of readiness of the school district and also can be used to craft a blueprint for improving those deficient areas. The graphic shows the eight (8) categories currently being used to measure the degree of readiness. The following pages provide details surrounding the variables that are being analyzed during the analysis process.



# Categories and Variables Being Measured

**Note:** These are generic categories and questions being asked are not specific to any one district. Each bullet point receives a score that is averaged for the overall section.

## ❑ Impact of Facilities

- How does the availability or lack of space impact the district's level of readiness?
- How does the age of the schools impact cabling, wireless, and ability to connect to the Internet?
- Does poor air conditioning or ventilation in server rooms, network closets, or computer rooms present a risk to the availability of the computers for testing?
- Are there situations where rodents chew through cables and bring down the district computer network? How long is the network down and what is the frequency of these events?
- Are there leaky ceilings, poor flooring, mold, or other environmental conditions that could impact the testing facility?

## ❑ Readiness of Infrastructure

- How does the amount of available network bandwidth impact the testing strategy?
- Are there any risks to testing due to the "up time" of the district (or school's) network?
- How many simultaneous testing machines can a district handle during any block of time?
- Does the district need additional wireless access points to conduct testing activities?
- Do the age and type of routers or switches impact the performance of the network and the ability of students to test in a given timeframe?
- Does the current wiring/cabling of the network impact the overall system performance? Is there anything that needs to be improved to enhance the testing experience?
- Is there any evidence that the security of the district's networks or computers could impact online testing?

## ❑ Readiness of Existing Hardware

- How does the number of available computers directly impact the district's ability to test?
- Is there a need to upgrade the available memory (RAM) in the testing computers? How much memory is currently in the testing machines and what (if any) performance issues have been witnessed?
- Are there any concerns over the size or quality of the testing monitors?
- Is there evidence that the different types of equipment being used for online testing directly impact the staff's ability to support the technology? Are there multiple products in use overcomplicating the support strategy and overall skills of the district staff?
- Do the current operating systems of the testing computers limit the ability to test? Are there any upgrades being planned and when will these take place?
- Are there adequate backup testing machines and/or accessories to ensure the necessary number of devices on the day of testing?
- Are there any procurements currently being contemplated and will they need to be amended to reflect changes to the testing strategy?

## ☐ **Teacher Readiness**

- Are the teachers adequately prepared for 2017 online testing requirements?
- Do the teachers require professional development training to educate them on how to better leverage technology?
- Do the teachers require assistance creating and conducting computer literacy classes for their students?
- Does the district have funding to offer computer literacy?
- What is the turnover rate of the teachers? How does the turnover rate impact the district's testing strategy?
- How do the teachers interact with the district technology staff?
- Are teachers aware of testing policies and are they properly prepared to manage testing cycles?
- Do the teachers need assistance in preparing their students for computer literacy?
- Are there any other concerns related to a teacher's knowledge or ability to assist with online testing?

## ☐ **Student Readiness**

- How does the level of computer proficiency of the student's impact online testing? Are there any concerns that students are not properly prepared to take a test on a computer?
- Does the district offer kindergarten through second grade computer classes?
- Is there any proactive analysis to identify disadvantaged students in a classroom with little to no computer literacy? What, if anything, is the district doing to help these potentially at risk students?
- Does the district allow students to check out computers to take home?
- How does a district manage situations where two different teachers leverage technology differently? Is there any analysis into the student's technology proficiency between these two scenarios?
- Does the district offer practice tests to allow the students to get familiar with the testing process and what is expected of them?
- Are students aware of testing policies and the implications?
- Is there any evidence from previous online testing cycles that students need assistance in specific areas? Examples might include: typing skills, knowledge of scrolling or potentially how to properly use a mouse.

## ☐ **Technology Support**

- How many resources are available at the district level and what are their roles and responsibilities?
- What are the main skills of the staff? Are there any skills missing in the support model?
- What functions are outsourced?
- What kind of help desk system is in place and how many ticket items are open?
- How many job duties does the staff have to perform?
- Does the district staff have any assistance from within the school?
- What would the impact be on the school's ability to test if a key resource were to call in sick or resign during the testing window?
- Are there any concerns about the availability of technology staff to support the testing process?
- Are policies and testing procedures documented and disseminated to all staff?
- Are students and their families made aware of the testing policies and schedule?
- Does the technology support team regularly communicate their needs to the administration and/or school board? What is the relationship between these parties?

## ❑ **Funding Mechanisms**

- Does the district leverage all available e-Rate funds?
- How has the district utilized e-Rate funds in the recent past?
- Does the district have experienced grant writers?
- How have technology related grants been utilized in the recent past?
- Are there any funds from e-Rate or grants that have NOT been utilized but could be leveraged to help improve the overall readiness of the district for online testing?
- Who writes the e-Rate documentation and grants? Internal or external resources?
- Are there other sources of funds the technology staff has access to and for what are they used?
- How does the district determine how the funds will be utilized?
- Are there any situations where money earmarked for technology is denied and utilized for non-technical district needs?
- What is the role of the technology staff in setting budgets and preparing for online testing needs?
- Is there a formal mechanism for cross training multiple district staff in the rules, regulations and nuances of applying for e-Rate, grants or other funding sources?
- How are the district's funds allocated for student computer literacy being spent?

## ❑ **Strategic Planning**

- Does the district have an up to date district wide strategic plan?
- Does the district have an up to date district technology strategic plan?
- Are the district's strategic plan and the TECHNOLOGY strategic plan properly aligned?
- What is the level of involvement of the local school board?
- Who is involved in strategic planning?
  - *Superintendent?*
  - *Teachers/Faculty?*
  - *I/T staff?*
  - *Local Vendors?*
- How does the district proactively plan for new technology acquisitions?
- How do the schools leverage district I/T staff?
- How are students or teachers leveraged?
- How are local technology vendors utilized?
- What is the level of involvement with the local "consortium"?
- How does the technology staff procure hardware or services?
- Is there a risk of "single point of failure" with the district staff member?
- Does the district need specific training in proper strategic planning?
- What assistance is required from the state?

## Overview of Readiness Rating Scale

To evaluate the readiness of a district in multiple areas the team created a rating scale to objectively measure how effectively (or ineffectively) a particular area rates compared to other districts. After each area has been given a score the analysis team compiles the statistics and averages them to derive a final readiness score for the district. To simplify the process the consultants used a scale of 1-5 that increases in increments of half a point. The following scale will be used to track future readiness decisions:

Rating	Description
<b>1</b>	The district is unable to prove they can successfully complete online testing in 2017.
<b>2</b>	The district could feasibly conduct testing in 2017 but there are multiple areas that need to be improved to make this happen and if they are not completed testing will more than likely be unsuccessful.
<b>3</b>	The district will be able to meet the 2017 Online Testing requirements. The district will not be able to handle additional subjects or grade levels without significant improvement in multiple areas.
<b>4</b>	The district will be able to meet the 2017 Online Testing requirements and they can meet a few extra subjects or grades but not all future needs.
<b>5</b>	The district is prepared for 2017 and beyond. They do not have any measurable risks associated with Online Testing for 2017 or beyond. They can handle online testing for all grades and subjects.

## Summary of Findings for Abbeville County School District

<b>Overall Readiness Score</b>	<b>3.4</b>
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### Impact of Facilities

<b>Readiness Score</b>	<b>3.3</b>
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Area of Focus	Observations	Recommendations
<b>Availability of Testing Labs</b>	<ul style="list-style-type: none"> <li>• 4 of 9 schools do not have enough labs to house adequate test seats to test within state on-line test window.</li> <li>• Additional space for labs may be available.</li> </ul>	<ul style="list-style-type: none"> <li>• Lab requirements need to be reviewed with school administration to determine if space is available.</li> <li>• If additional lab space is not available then computer carts will need to be purchased to provide adequate test seats.</li> </ul>
<b>Age of Buildings and Impact on Cabling and Wireless Connectivity</b>	<ul style="list-style-type: none"> <li>• 2 Schools are between 59 and 62 years old.</li> <li>• 3 Schools are between 31 and 44 years old.</li> <li>• 3 Schools are 21 years old.</li> <li>• 1 School is 15 years old.</li> <li>• Cabling is current technology and adequate for all schools.</li> </ul>	<ul style="list-style-type: none"> <li>• No recommendations for this area.</li> </ul>
<b>Environmental Concerns</b> (i.e. mold, air conditioning and ventilation concerns, excessive noise)	<ul style="list-style-type: none"> <li>• There are issues with adequate ventilation in data closets in schools.</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate ventilation in data centers is essential to ensure on-line testing can be conducted without interruptions. HVAC requirements should be determined for all data closets and additional air condition be procured.</li> </ul>

**Condition of desks and chairs where students will be testing**

- There are a few issues with desks and chairs in computer labs.

- A formal assessment of furniture in computer labs should be conducted to ensure all furniture is in good shape and appropriate for grades using the lab.

## Infrastructure

Readiness Score	3.7
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Area of Focus	Observations	Recommendations
<b>Available Bandwidth to the district</b>	<ul style="list-style-type: none"> <li>350 mbps rated, but actual throughput less than 300 mbps.</li> <li>More thorough bandwidth testing is needed to verify actual speed.</li> </ul>	<ul style="list-style-type: none"> <li>Formal analysis of the network's configuration to determine if the available bandwidth is able to meet the needs of the district during online testing activities. Contracting with 3rd party experts may be necessary to ensure the routers, switches, access points and cabling are properly integrated and successfully maximizing the available bandwidth. Corrective action should be taken to further "tune" the networks and support components. There are specialized tools available to help assess a network's efficiency and it may be necessary to leverage a 3rd party to help justify purchasing additional incoming bandwidth to rectify the performance challenges.</li> </ul>
<b>Stability of Networks Within The Schools</b>	<ul style="list-style-type: none"> <li>There are no connectivity issues with school networks.</li> <li>School networks are stable and reliable.</li> </ul>	<ul style="list-style-type: none"> <li>Formal performance testing (load testing) should be conducted to ensure networks can adequately handle the demands on on-line testing and streaming educational video content.</li> </ul>
<b>Available Bandwidth to the Schools</b>	<ul style="list-style-type: none"> <li>All schools have between 500 mbps and 1 GB (1000 mbps).</li> </ul>	<ul style="list-style-type: none"> <li>No recommendations for this area unless district's incoming bandwidth exceeds 500 mbps.</li> </ul>
<b>Cabling Challenges</b>	<ul style="list-style-type: none"> <li>Cabling is current technology and adequate for all schools.</li> </ul>	<ul style="list-style-type: none"> <li>No recommendations for this area.</li> </ul>

<b>Wireless Networks</b> <ul style="list-style-type: none"> <li>• Routers</li> <li>• Access Points</li> <li>• Bandwidth</li> <li>• Switches</li> </ul>	<ul style="list-style-type: none"> <li>• Technology Director will complete a wireless upgrade project that will provide one wireless access point for each classroom.</li> <li>• Routers and switches have been recently upgraded.</li> </ul>	<ul style="list-style-type: none"> <li>• No recommendations for this area.</li> </ul>
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## Hardware

Readiness Score	2.8
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Area of Focus	Observations	Recommendations
<b>Number of Computers Available for Testing</b>	<ul style="list-style-type: none"> <li>• 4 of 9 schools do not have enough computers to provide adequate test seats to test within state on-line test window.</li> <li>• Additional space for labs may not be available.</li> </ul>	<ul style="list-style-type: none"> <li>• Additional computers need to be procured to enable testing to be completed with state on-line testing window.</li> <li>• If additional lab space is not available then computer carts will need to be purchased.</li> </ul>
<b>Age and ability to upgrade computers</b>	<ul style="list-style-type: none"> <li>• To maximize use of available funds the Director of Technology has purchased off lease and refurbished computers. Some of these computers are approaching the end of their useful life.</li> <li>• Some labs have windows XP computers that will not support on-line testing.</li> </ul>	<ul style="list-style-type: none"> <li>• Testing should not be attempted on a windows XP computer.</li> <li>• A review of should be conducted of older computers to verify they are adequate for on-line testing.</li> </ul>
<b>Available RAM (Memory) in testing computers</b>	<ul style="list-style-type: none"> <li>• Mixture of 4GB and 8GB available RAM.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimum of 4GB RAM is required for on-line testing. Consultants recommend 8 GB RAM when possible to accommodate increased on-line educational video.</li> </ul>

<b>Disaster Recovery Solution</b>	<ul style="list-style-type: none"> <li>• There a risk that the district's system could go down during testing and impact the ability to test the students.</li> <li>• District does not currently have an offsite backup solution.</li> </ul>	<ul style="list-style-type: none"> <li>• A disaster recovery solution is needed to ensure the district's platforms are available during online testing.</li> <li>• Consulting team is recommending the state offers a cloud backup and disaster recovery solution to district.</li> </ul>
<b>Adequate replacement hardware</b>	<ul style="list-style-type: none"> <li>• District has no backup computers to use for online testing.</li> <li>• District has no spare laptop batteries to use during online testing.</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase and maintain a healthy supply of backup machines, batteries, keyboards and mice.</li> <li>• Create a formal hardware replacement policy.</li> </ul>
<b>Support and Replacement Strategy</b>	<ul style="list-style-type: none"> <li>• District currently does not have a replacement strategy.</li> <li>• Funding is not predictable and purchases are made when funds are available.</li> </ul>	<ul style="list-style-type: none"> <li>• An ongoing replacement and funding strategy needs to be developed.</li> </ul>

## Teacher Readiness

Readiness Score	3.7
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Area of Focus	Observations	Recommendations
<b>Technical Proficiency of Staff</b>	<ul style="list-style-type: none"> <li>Teachers are comfortable with the technology they have available.</li> <li>Additional technology training is welcome but not readily available due to resource (people and money and time) constraints.</li> </ul>	<ul style="list-style-type: none"> <li>Additional professional development is warranted but must be accompanied by a formal plan on how and when to leverage the training resources. The teachers should be held accountable by administration to take the training and utilize the lessons learned in their job functions.</li> </ul>
<b>Turnover of Teachers</b>	<ul style="list-style-type: none"> <li>District has a retention rate of 92.2% which is better than many districts.</li> </ul>	<ul style="list-style-type: none"> <li>No recommendations are needed in this area.</li> </ul>
<b>Level of Technical Preparedness</b>	<ul style="list-style-type: none"> <li>District has one teacher technology coach who is also responsible for state reporting and supporting Power School users.</li> <li>Principals sign off on teacher's technical competency.</li> </ul>	<ul style="list-style-type: none"> <li>A formal curriculum for technology training should be developed to insure teachers are kept current on technology used by the district.</li> </ul>
<b>Availability to prepare for testing</b>	<ul style="list-style-type: none"> <li>On-line testing requires significantly more preparation than paper testing. The lack of a dedicated testing coordinator at each school will place additional burden on the limited technical staff during on-line testing.</li> <li>Technology staff is not always kept current on testing requirements and timetables.</li> </ul>	<ul style="list-style-type: none"> <li>Each school should designate someone to serve as front line support during online testing to reduce the risk of single point of failure in this area.</li> <li>Detailed technical requirements for testing computers needs to be available to district technology staff well</li> </ul>

		before testing is to begin.
<b>Other Concerns</b>	<ul style="list-style-type: none"> <li>The one Instructional Technology Coach is stretched thin. The addition of at least one Instructional Coach would greatly improve the district's ability to effectively train teachers.</li> </ul>	<ul style="list-style-type: none"> <li>Additional resources that have these specialty skills are desperately needed.</li> </ul>

## Student Readiness

<b>Readiness Score</b>	<b>3.4</b>
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Area of Focus		
<b>Availability of Computer/Typing Classes for K-2</b>	<ul style="list-style-type: none"> <li>Students in K-2 are taught computer skills at all schools.</li> <li>District is using a web based curriculum, Typing Master, at all schools.</li> </ul>	<ul style="list-style-type: none"> <li>Keyboarding lessons need to start prior to the 3<sup>rd</sup> grade. Formal keyboarding activities are necessary to ensure 3<sup>rd</sup> graders are prepared for the testing requirements.</li> <li>District should ensure Typing Master curriculum is being consistently utilized for K-2 students.</li> </ul>
<b>Level of Poverty/Home Exposure to Computers</b>	<ul style="list-style-type: none"> <li>69% of students are on free and reduced lunch.</li> <li>District provides exposure to computers through computer literacy classes.</li> </ul>	<ul style="list-style-type: none"> <li>The fact that many of the district's students come from homes where heavy and consistent computer usage is unlikely only increases the need for formal computer Literacy classes in the earlier grades.</li> </ul>
<b>English as a Second Language Concerns</b>	<ul style="list-style-type: none"> <li>The district has an ESL population of 3.6%.</li> <li>Practice tests are given.</li> </ul>	<ul style="list-style-type: none"> <li>The consultants recommend that district staff continue to work closely with the schools to formally give the ESL students an opportunity to take a practice test to ensure they are adequately prepared for the testing activities.</li> </ul>

		Simulated testing will help identify any potential concerns a proactive manner.
<b>Availability of Sample Tests</b>	<ul style="list-style-type: none"> <li>Practice tests are available at all schools.</li> </ul>	<ul style="list-style-type: none"> <li>Continued emphasis to provide student opportunity for practice testing at all schools.</li> </ul>
<b>Other Concerns</b>		

## Funding Mechanisms

Readiness Score	3.4
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Area of Focus	Observations	Recommendations
<b>Maximizing e-Rate</b>	<ul style="list-style-type: none"> <li>The district is maximizing available federal e-Rate funds.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure the district's strategy for utilizing current and future e-Rate funds are documented in the strategic plan.</li> <li>Recent changes in e-Rate funding should be reviewed to determine the impact on district's strategy for utilizing e-Rate and funding needs e-Rate will no longer be funding</li> </ul>
<b>Ability to successfully manage the grant writing process.</b>	<ul style="list-style-type: none"> <li>There is no in-house expertise at writing grants and no easy way to know what grants are available.</li> </ul>	<ul style="list-style-type: none"> <li>District needs resource for determining which grants are available and to assist in writing grant requests.</li> <li>Grant writing is a skill set that district staff does not have. Consultants are recommending that the district uses a resource with grant writing knowledge that is shared with other districts.</li> </ul>
<b>Multiple resources knowledgeable in e-Rate and Grant Writing</b>	<ul style="list-style-type: none"> <li>The district uses a consultant to write e-Rate requests, along with the input and involvement of the Director of Technology.</li> <li>There is no in-house expertise at writing grants.</li> </ul>	<ul style="list-style-type: none"> <li>District needs resource for determining which grants are available and to assist in writing grant requests.</li> </ul>
<b>Other Concerns</b>		

## Strategic Planning

Readiness Score	3.8
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Area of Focus	Observations	Recommendations
<b>Technical Staff Collaborates with Administrative Staff to Determine Technology Needs</b>	<ul style="list-style-type: none"> <li>The Director of Technology informs the administrative staff of the district's needs for upgraded technology.</li> <li>Director of Technology attends School Board meetings each month and presents as needed.</li> </ul>	<ul style="list-style-type: none"> <li>Best practices dictate that the technology staff regularly updates the school board on technology usage and needs</li> </ul>
<b>Thoughtful analysis into how funds will be spent</b>	<ul style="list-style-type: none"> <li>The technology staff has plans in place to build the correct technological infrastructure that is needed.</li> <li>The team saw multiple examples of I/T staff taking extra steps to be fiscally conservative with funds. Purchasing refurbished machinery is an example</li> </ul>	<ul style="list-style-type: none"> <li>Continued strategic planning efforts are required. Communicating to the school board and ensuring all parties are aware of the importance of consistent funding for technology and professional development is critical.</li> </ul>
<b>Teachers needs are considered top priority</b>	<ul style="list-style-type: none"> <li>The district does a consistent job focusing on the teachers and their needs. Technology staff are strategically deployed as needed.</li> </ul>	<ul style="list-style-type: none"> <li>Schedule predictable technology tasks for optimal utilization of limited technology staff.</li> </ul>
<b>The role of technology is agreed upon by all parties</b>	<ul style="list-style-type: none"> <li>The Director of Technology collaborates with other departments to ensure the needs of the district are met.</li> </ul>	<ul style="list-style-type: none"> <li>A more formal process for reviewing the role of technology in the district is recommended.</li> </ul>
<b>Proper amount of professional development</b>	<ul style="list-style-type: none"> <li>Technology staff has limited time available to pursue additional professional development for teachers.</li> <li>One District Technology Coach provides professional development for all teachers in the district.</li> </ul>	<ul style="list-style-type: none"> <li>Additional professional development for teachers in the district is a desirable investment.</li> </ul>

**Implementation,  
Distribution and  
Enforcement of Testing  
Policies.**

- The district staff is very busy. Formal policies and procedures for current testing requirements may not be up to date.
- Everything dealing with online testing must be coordinated with the director of technology and the testing coordinator to make sure all needs are met.

## Readiness of Technical Staff to Support Online Testing

Readiness Score	3.0
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Area of Focus	Observations	Recommendations
<b>Number of support technical support staff</b>	<ul style="list-style-type: none"> <li>Staff consists of Director of Technology and 2 technicians.</li> <li>The district also has a Teacher Technology Coach that reports to Director of Instruction.</li> </ul>	<ul style="list-style-type: none"> <li>For a district with this number of schools and students the number of support staff is marginally adequate or maybe inadequate. A review of tasks and projects supported by the technical staff should be conducted to identify areas where additional resources maybe needed.</li> </ul>
<b>Technical skills and proficiency of support staff</b>	<ul style="list-style-type: none"> <li>Technician 1- Associates Degree in computer networking, A+ certification, 2 years on the job, 10 years experience with technology.</li> <li>Technician 2 - B.S. in political science, 1st year on the job, worked help desk at previous job for 4 years.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing professional development of support staff should planned to ensure staff is trained on new technology.</li> <li>The district may need more specialized services at time. Ideally these services could be provided through a consortium of several districts.</li> </ul>
<b>Availability of staff to proactively engage with the teachers and administrative staff</b>	<ul style="list-style-type: none"> <li>Director of Technology and staff try to be as proactive as possible in resolving technology issues that teachers and staff encounter.</li> </ul>	<ul style="list-style-type: none"> <li>Having resources inside the schools serve as the front line for help desk items might be needed. Training of school resources OR students could help reduce the help desk ticket volume and free up I/T staff to be more strategic and address technology projects.</li> </ul>
<b>Ability of staff to assist with professional development efforts</b>	<ul style="list-style-type: none"> <li>District has one Teacher Technology Coach and is challenged to provide both technical coaching and teacher professional development.</li> </ul>	<ul style="list-style-type: none"> <li>Additional professional development resources (people, money, time) are easily quantifiable and should be made available to the Technology Department.</li> </ul>

**Risk of Single Point of Failure. If a key resource leaves will testing become at risk?**

- Staff consists of Director of Technology and 2 technicians, if one resource is no longer available district would be challenged to provide support for on-line testing.
- An effort should be undertaken to cross train the technicians with duties of Director of Technology to be able to provide backup for each other.

## Additional Consultant Observations

Highlighted below are the most frequently cited strengths of the school district, which can be used as a foundation for creating a roadmap to address any areas of concern. The items in the table are rank-ordered according to the frequency with which they were mentioned in the interviews. Multiple points of engagement took place with a minimum of two analysis team members involved with every district.

Rank	Strengths	Common Themes
1	Willingness to improve	Everybody wants this to happen. A lot of people are ready for change. Everyone is tired of fighting fires and not having the ability to proactively address many of the things that need to be corrected.
2	Attitude / Enthusiasm	Extremely eager to make testing a success. Cooperative and positive attitude of management and staff. Excitement and positive attitude toward this project.
3	Work well together	Sense of collegiality - we work well together. We're small; we'll pull together to make this happen. Partnerships among schools, other districts and/or vendors. We will come together on this.
4	Dedication	Level of commitment. Very dedicated people, people who are willing to get the job done and get it done well. Hard workers who are willing to do whatever it takes to get the job done.

## Commonly Cited Concerns

Listed below are the most frequently cited concerns about testing that were documented over the course of the analysis process.

Rank	Concern	Sample Answers
1	Budget	Concerns that the funds that will be necessary to procure additional infrastructure, hardware and/or professional development will be insufficient.
2	Schedule / timeline	Time it will take to plan, procure, implement, test and train staff is inadequate to prepare for Spring of 2017 given the ongoing workload of the district staff.
3	Staffing Levels and Workload	Inadequate staff to complete the workload to prepare for testing. The focus on assisting teachers and their classroom technology consumes the majority of the staff's time leaving little availability for additional tasks.
4	Lack of Professional Development	New or upgraded technology will require significant training. There are limited funds available for professional development and few resources available to conduct the training.
5	Disaster Recovery	Limited funds available for proper disaster recovery.

## District's Inventory of Readiness Needs

### Testing Inventory Sheet

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
Facilities	Space/Testing Rooms					
	Air Conditioning Unit	Carrier/Trane	1 per MDF, TC, and Lab \$2500 ea X 27 locations	\$67,500	TBD	07/2016
	Roof/Ceiling Repair					
	Desks					
	Chairs					
	Other					

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
Infrastructure	Bandwidth	CIO/Spirit	1 Gbps	Unknown	TBD	2017
	Router	Palo Alto firewall	1	\$16,000	TBD	07/2016
	Switches	Avaya ERS			E-Rate	In Progress
	Access Points	Aerohive			E-Rate	In Progress
	Cabling	Telcom			E-Rate	In Progress
	Installation/Testing	Contracted	X # hours	\$250/hr	E-Rate/Local Budget	Ongoing
	Disaster Recovery	Zerto/eGroup	1	\$15,000	TBD	07/2016
	Other	Electrical Generator for main datacenter  Battery backup units for network closets	1  25	\$25,000  \$400 (\$10,000)	TBD  TBD	07/2016  01/2017

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
<b>Hardware Testing Computers</b>	Laptops	Dell	240 @	\$120,000	TBD	01/2017
	Chromebooks	Dell	\$500	\$60,000	TBD	01/2017
	Workstations	Dell	240 @	\$75,000	TBD	01/2017
			\$250			
			200 @			
			\$375			
	Memory	Dell	200 @ \$30	\$6000	Local budget	In progress
	Operating System Upgrade	Microsoft	250	\$13,000 annual contract	Local budget	In progress
	Monitors	Dell	200 @\$125	\$25,000	TBD	01/2017
	Computer Carts	Lock N Charge	16 @\$1600	\$25,600	TBD	01/2017
	Extra Batteries	Dell	30 @ \$70	\$2,100	TBD	01/2017
	Installation/Testing	Temporary Employees	X # hrs	Unknown	Local budget	In progress
	Other					

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
<b>Teacher Readiness</b>	Type of training needed by grade and by topic	Testing Proctor Readiness	400	\$25,000	TBD	Fall 2016
	Teacher's Knowledge of Online Testing Requirements including security	SANS.ORG	400	\$25,000	TBD	Fall 2016
	Other					

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
<b>Student Readiness</b>	Computer Literacy Curriculum		3000			
	Computers needed for training	Dell	500 @ \$700	\$350,000	TBD	Fall 2016
	Practice Tests for at risk students (i.e. lack of computer experience, English as a second language...)					
	Other					

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
<b>Funding Mechanisms</b>	Assistance/Training for Writing Grants		As needed	\$5000 annually	TBD	07/2016
	Assistance/Training to manage e-Rate	Service Associates	Hours vary monthly	\$15,000 annually	Local budget	Ongoing
	Other					

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
<b>Strategic Planning</b>	Consulting Assistance to educate staff in the strategic planning areas		As needed	\$7000	TBD	07/2016
	Formal Training of Staff		As needed	\$10,000	TBD	07/2016
	Other					

Category	Specific Need	Vendor	Quantity	Estimated Cost	Potential Funding Source	Date Needed
<b>Technical Support</b>	Consulting Assistance to help in specific areas	Integrity Networks	As needed	\$15,000	Local/TBD	Ongoing
	Additional resources	Security consulting	As needed	\$7000	Local/TBD	Ongoing
	Other					

## Strategic Roadmap (Infrastructure/Technical)

This section will provide an overview of the specific action items the district should focus on to improve the readiness of each area discussed in this report. The Roadmap is broken down into measurable tasks and deliverables to

### **1-Month Plan (May 2016)**

- Complete inventory needs assessment as required by testing readiness consultants
- Confirm manufacturer/model/quantities for needed improvements
- Confirm final pricing for needed equipment and services
- Analyze findings as reported by testing readiness consultants
- Present findings to Superintendent and Board of Trustees

### **3-Month Plan (Summer 2016)**

- Hire temporary part-time employees to assist with workstation upgrades and other projects
- Continue upgrading memory to at least 4GB in all workstations to be used for testing
- Upgrade remaining elementary school computer labs to Windows 7 or higher where needed
- Inspect, repair, replace, and reimage as needed computer lab workstations
- Inspect, repair, and reimage as needed Chromebook inventory to be used for testing

### **6-Month Plan (Fall 2016)**

- Continue deployment of high density wireless network to all schools in District
- Replace network equipment as needed for computer labs across District
- Implement network security and performance monitoring
- Install power generator for main datacenter
- Install reliable battery back units in all network communications equipment locations
- Install air conditioning units in all network communications equipment locations
- Upgrade DIA internet connection from 350 Mbps to 500 Mbps
- Implement disaster recovery system for off-site replication of mission critical servers/services

### **12-Month Plan (Spring 2016)**

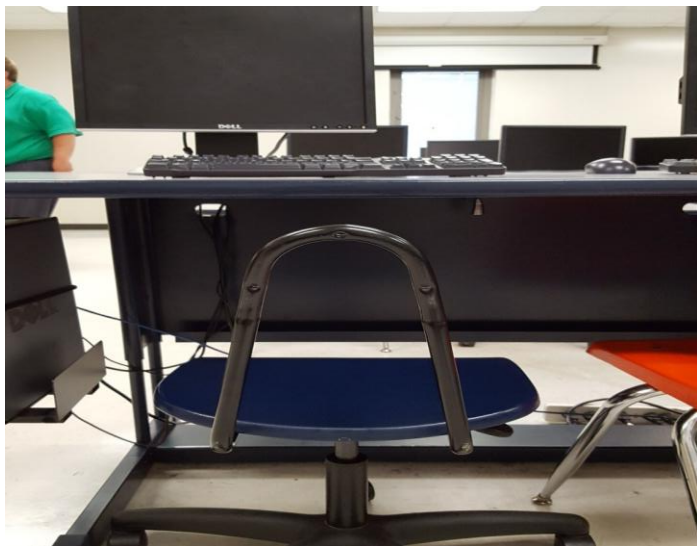
- Continue deployment of high density wireless networks to all schools in District
- Deploy additional Chromebook carts and Windows laptop carts
- Deploy virtual desktop infrastructure (VDI) for version consistency and desktop security
- Upgrade DIA internet connection from 500 Mbps to 1 Gbps
- Implement redundant/failover Palo Alto firewall appliance

**18-Month Plan (Summer 2016)**

- Hire temporary part-time employees to assist with workstation upgrades and other projects
- Replace aging hardware in existing computer labs
- Upgrade workstations to Windows 10
- Replace aging hardware in Chromebook carts
- Deploy additional Chromebook carts and Windows laptop carts

# APPENDIX

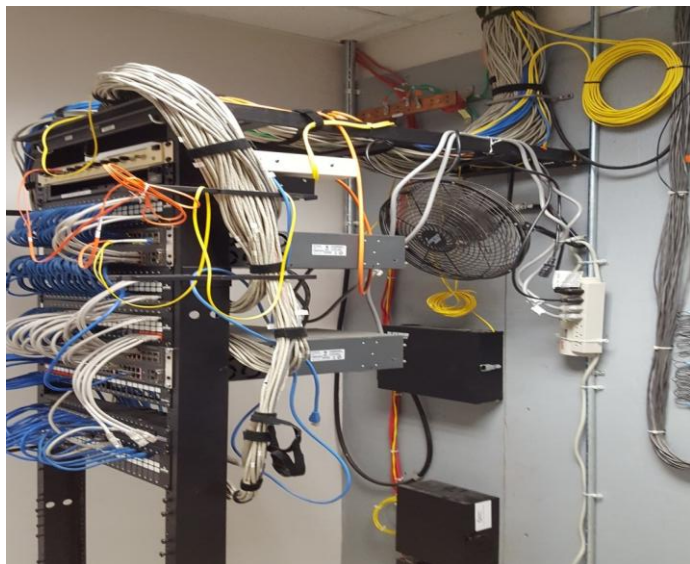
## Pictures of District



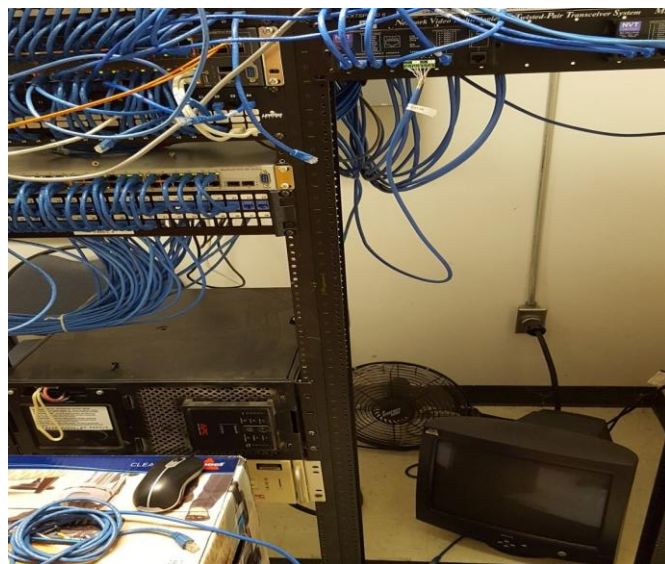
Computer Lab chair with broken back



Cooling computer lab with fan  
Mismatched chairs



Data Closet missing A/C, using fans for cooling.



Data Closet missing A/C, using fans for cooling.